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REVIEW OF UNTOWARD EFFECTS FOLLOWING ARSPHENAMINE AND ITS DERIVATIVES.

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Now that it is about ten years since salvarsan was first introduced, it would seem that, though it is still too early to say much about how far we have progressed in the cure of syphilis, we should, nevertheless, be able to tell what untoward effects may follow its use.

In the first place, what is the normal reaction following its use? Usually there is nothing or only a slight malaise with nausea for a few hours. Nearly half the patients show a moderate fever on the day of injection with phenomena due to dilatation of the capillaries, a direct action of arsenic, showing flushing of the face, occasionally slight edema of the lids or lips, chilly sensations, more or less marked, often followed by sweating, occasionally profuse; fairly often nausea and slight headache. There may be vomiting once or twice, or even repeated during the night, with severe headache and marked congestion of the conjunctivae. If active lesions are present, there is often a temporary exaggeration of these, the Herxheimer reaction. Formerly these general symptoms were regarded as due in large part to impurities in the water, but during the war the water used was frequently not freshly distilled and so long as it was fairly fresh and absolutely sterile, it did not seem to cause a great deal more reaction. As these symptoms are far more common in those having active lesions at the time, it seems that very likely they are a sort of a general Herxheimer reaction and Gobeau[1] thinks that this is so frequently the case that the immediate reaction means considerable as regards present activity of the disease. On the other hand, these are all symptoms described in the pharmacology of arsenic and it would seem that most of the reactions could be ascribed to toxic effects of the latter, in a large number of cases, with the impurities of the water and the generalized Herxheimer reaction as contributory factors. The varying personal idiosyncrasies toward the drug would account for the freedom of some people from the reactions and the affections of others. Then, too, it is quite noticeable that, in some cases, the reactions are increased by inability of the patient to eliminate the drug through disease of the liver and kidneys, especially the latter.

These normal reactions last a few hours, not more than ten or twelve or at the very most twenty-four. If the fever lasts longer than this it is a sign of intolerance. Another type of fever showing intolerance on the part of the patient is that appearing from the second to the sixth day, usually after the patient has had several previous doses of the drug. It is also seen after mercury and if the patient has had both we distinguish those due to mercury by other signs of mercury poisoning, such as the metallic taste, salivation, fetid odor of breath and soreness of the gums. When due to the arsphenamine, the fever is often accompanied by other signs, such as severe vomiting and headache, urticarial lesions at site of injection or elsewhere on the body, or a general erythematous rash, edema of the face and hands and feet and pains in the bones or joints. This fever generally reaches 102 or 103° F., or even higher, and instead of falling at once as in the normal reaction, remains elevated for three or four days or longer, falling by lysis. This is always a sign of intolerance and the drug should either be suspended for a time or entirely interrupted.

The skin manifestations usually appear eight to ten days after the injection of arsphenamine, though they may appear immediately. The outbreak is usually accompanied by considerable fever, headache and general malaise, with occasional vomiting. Urticarial, scarlatiniform and morbilliform rashes and, occasionally herpes labialis and even herpes zoster have been described. These all last three to six days. Those resembling measles and scarlet fever are followed by desquamation. A more serious skin complication is dermatitis exfoliativa. One case seen lately shows the milder form of this:

Mrs. H., aged 58, housewife. Diagnosis: Tabes. Wassermann reaction on blood and spinal fluid strongly positive. Cell count 75. Globulin positive. Given six doses of diarsenol (0.4 to 0.6) at intervals of one to two weeks. Severe, prolonged reaction following each dose, especially the later ones. No mercury given. Fourteen days after last dose general, intense redness of skin with beginning scaling. In places oozing and crusting, especially where surface has been rubbed. Followed by lamellar desquamation of entire surface, including palms and soles, which was completed about the seventeenth day. Considerable edema of face and of forearms and lower legs at start with marked congestion of conjunctivae. Mucous membranes normal except for some fissuring and scaling of lips. Urine showed no albumin or sugar at any time.

Following is a case from the skin service at the Boston City Hospital, reported through the kindness of Dr. T. W. Thorndike, with postmortem findings quoted through the courtesy of the medical examiner, Dr. T. W. Leary.

G. S. Male. Aged 36. Blacksmith. Admitted to hospital July 8, 1919. History of chancre three months previously with positive Wassermann reaction. Treated by private physician with mercury pills and five doses of arsphenamine (dose and variety of drug not ascertained) during a period of four weeks. Last dose eight days before entrance to hospital. Present condition started five days after last injection. On entrance showed general erythema with profuse scaling, oozing and crusting in places. Edema of face and extremities. Process soon involved mouth, with swollen and bleeding gums and inability to take nourishment. Rather rapid loss of strength and emaciation. Urine showed slightest possible trace of albumin at entrance, which soon disappeared. Temperature normal for first few days. Slight watery discharge from both ears at entrance, which persisted. Malnutrition increased. Septic temperature and cough developed and patient died four weeks after onset of rash. Postmortem showed double otitis media, broncho-pneumonia and practically nothing else.

Another skin condition which has been described is melanosis. Generally after the last of a course of injections the patient has had an erythematous rash followed by desquamation which latter persisted for some time and was accompanied by a general bronzing of the skin of the entire surface. In several cases reported there was also a keratosis of the palms and soles, in one of them markedly warty, such as seen in chronic arsenic poisoning. One case of this observed in my practice was a woman, Mrs. J. P., aged 38, who had had a gumma of the liver removed some seven years previously and had lately developed lichen planus, for which she had received considerable arsenic in the form of Fowler's solution. Shortly after receiving salvarsan, 0.6 g., without rash or symptoms of malaise, the skin gradually turned dark, especially about the folds of the axillae and on the buttocks until the skin was generally of a dark brown tint. Like the cases mentioned in the literature, there was no pigmentation of the mucous membranes such as is found in Addison's disease and, like most of them, the color, after a matter of three or four years, has gradually returned to normal. This case never showed the keratoses of the palms and soles. These cases have been noted in all stages of syphilis under treatment with salvarsan. After the milder scarlatiniform and morbilliform rashes the arsphenamine may be resumed in a few weeks without much fear of a recurrence of the rash, though a few cases of recurrence have been reported. It seems better, as suggested by Gutmann,[2] to change the preparation in these cases. After the dermatitis exfoliativa, or melanosis, it would seem better to avoid further use of arsphenamine preparations, or at any rate to wait at least for several months and then proceed with very small doses and at long intervals. All these are undoubtedly due to arsenic poisoning as they have all been noted in chronic arsenic poisoning cases. Possibly an idiosyncrasy makes the patient more susceptible, but it is arsenic poisoning just the same.

Outside of the neuralgic pains often seen after arsphenamine, little has been seen or written on the bad after effects of the drug on the peripheral nervous system. Variot and Bouquier,[3] however, report one case of peripheral neuritis in the legs, going on to paralysis and reaction of degeneration in the nerve trunks in a congenital case who had received three courses of six or eight injections each at three-week intervals. Pains in the legs were complained of during the last course. Pierre Marie[4] reports a transverse myelitis in another congenital case following an intensive course of treatment with arsenobenzol. Bory[5] reports a case of a primary lesion treated with three doses of arsphenamine who developed meningitis and myelitis commencing three days after the last dose and which left the patient with a spastic paraplegia. Closely allied to the peripheral nervous system is a polyarthritis described both by Chabonier, and Bleton[6] and also by Kutznitzky.[7] This seems to appear more frequently in women and especially in those who have received a good deal of arsphenamine. It appears about two weeks after the last dose of the drug, with pains, especially in the morning, but wearing off somewhat during the day. The joints appear normal on examination and the trouble seems to be in the bursae and muscular attachments around the joints. Any joints may be affected, often several of the larger ones at one time. The trouble clears up spontaneously in a few weeks. It is not materially affected as a rule by salicylates or mercury or arsphenamine. As this condition has been observed in cases other than syphilis who were treated with arsenic preparations, I think that there can be no question but that this is a case of poisonous effect of the drug. In speaking of the after effects of arsphenamine on the nervous system, I have purposely omitted speaking of the affection of the optic and auditory nerves, as I think that these have been shown to be unquestionably due to a recidive from too little and not too much treatment and, therefore, are due to syphilis and not to arsphenamine.

When we consider the action of arsphenamine on the brain, we come to one of the most serious aspects of the accidents following its use. The common pathological findings in these cases which have terminated fatally are an edema of the brain, frequently with minute hemorrhages, especially in the floor of the lateral ventricles. There has also been seen a true hemorrhagic encephalitis with multiple hemorrhages all over the surface of the brain. Many of the cases in the literature described as the latter or edema of the brain are, probably, too rapidly fatal or recover too rapidly for either condition to have developed, but there are a certain number of them, as shown by autopsy. Either directly after the injection or a few hours or even days later, the patient feels weak or has an epileptiform seizure, sometimes with fever of 102° F. or so, and then becomes unconscious. Sometimes the latter appears with very few premonitory signs. The pupils are dilated, sometimes react, and at others do not. Knee jerks are absent. Babinski present. Often tonic contractures of limbs and face muscles (trismus). Urinary incontinence, stertorous breathing, deepening of coma and death. Some of these cases have apparently been saved by venesection, lumbar puncture, salt solution infusions, adrenalin subcutaneously and intravenously and cardiac stimulation.

Another interesting and important accident following arsphenamine is the so-called anaphylactoid reaction. In some of these cases nothing is found at autopsy. In others edema of the lungs, frequently associated with an acute or chronic renal condition. Jackson & Smith[8] have shown that on dogs toxic symptoms are produced by increasing the concentration of the drug and at the same time increasing the rapidity of injection. Partly owing to the action of the arsenic in paralyzing the capillaries and partly, possibly, to multiple microscopic pulmonary emboli from precipitation caused by the drug, there is an immediate and progressive increase of pulmonary blood pressure, sometimes to 100% above normal. This increase was shown to be also due in part to the alkalinity of the solution. At the same time there is a fall in the systemic blood pressure, though not so marked (25-50%). The right heart is dilated and the kidney contracted. A number of the intermediary by-products formed in the manufacture of arsphenamine were tested and found to be non-toxic. It would seem that this increase in pressure on one side of the heart with decrease on the other would be likely to cause a delirium cordis, which has been noted clinically. Moreover, it would seem that this might be the cause of death in some of these cases where nothing has been found pathologically. It would also account for the edema of the lungs in some cases where no lesion of the kidney or cardio-vascular system is present. Clinically, these cases occur frequently after several injections of the drug, more rarely after the first. More often in the cases reported, the doses given were larger than those in general use today. Many of the cases had shown so-called intoxication symptoms after previous doses. In others there is an old valvular trouble or a previous kidney lesion. It has occurred in all the stages of the syphilitic infection.

The following case is related to me by Dr. H. M. Clute:

Male. Age 38. No organic lesions. Early latent syphilis. Had received two courses of neosalvarsan (a French preparation) without serious reactions. Given 0.9 g. neoarsenobenzol (French) in 20 c.c. of freshly distilled water. Patient all right for about three minutes. He then stated that something was wrong and gripped his chest. Face became red and edema of eyelids followed. Neck veins swollen. Choking sensation. Projectile vomiting. Then marked pallor, rapid, noisy and severe dyspnea and bulging of eyes. Given camphor in oil gr. 3. and atropin gr. 1/50 s.c. Pupils dilated, but reactions were normal. Reflexes normal. In about ten minutes entirely recovered except for marked weakness and slight swelling about the eyes. Next day no ill effects except that he felt as if he had been on a spree the night before.

Many of these cases terminate fatally at once or following a few days of coma with anuria, convulsions and pulmonary edema. In the latter form there is, usually, a cardio-vascular lesion which existed previously or a kidney lesion.

In the treatment of such cases, cardiac stimulants, artificial respiration, adrenalin and tyramine have been used with some success and some failures. Many of them could be avoided by using smaller doses as a routine and watching for prolonged and late fever after previous injections and for other signs showing intoxication, more especially in the cardio-vascular and renal cases.

Another danger in cardio-vascular cases is seen in cases of cerebral endarteritis. I had an unfortunate result a few years ago in the case of a physician who had just suffered a hemiplegia due to cerebral endarteritis. I gave him one small dose of salvarsan which was well borne and seemed to improve the general condition considerably. A week later, following a second dose of 0.6 g. the patient went into coma and died in 48 hours. I feel sure that this large dose caused an increased congestion or a fresh hemorrhage which proved fatal.

In aneurisms there may be softening of the coverings and rupture following arsphenamine, as in one case reported by Dever and Boles.[9]

I have already mentioned the danger of giving arsphenamine in cases of kidney disease. On the other hand, in advanced nephritis the drug may be used with caution and without deleterious effects. We have at the present time in the Out-Patient Department of the Boston City Hospital two cases of advanced chronic nephritis who have received repeated injections of arsphenamine without the least disturbance of the kidney, as shown by careful functional tests by Dr. W. R. Ohler in the hospital laboratory.

In regard to the digestive system, vomiting and diarrhea are so common that they need only to be mentioned. However, if either is prolonged and serious, it is a sign of intolerance and should be taken into account with the next dose and the future intervals.

In regard to the liver, the important complication is jaundice. Some cases of immediate jaundice have been reported, the earliest occurring about two hours after the injection, but, though some of these are due to the immediate toxic action of the arsphenamine, probably a large number of them are really due to syphilis. On the other hand, there is an increasing number of reports of jaundice following from one to five months after the last injection of arsphenamine. These have been reported in cases where no mercury has been used, so that element can be eliminated. Many run a mild course and some are quite severe and several have terminated fatally with acute yellow atrophy. The jaundice lasts, in those cases which recover, from three to thirteen weeks. It can occur in any stage of syphilis, including tabes. It has been reported after all makes and derivatives of arsphenamine and after one or many doses. Some cases follow an erythematous rash with desquamation, but more often not. About a half have no symptoms. Many have a prodromal period of digestive disturbance with vomiting or diarrhea. Many complain of a pressure sensation over the liver region, but rarely of real pain. The liver is often enlarged, but often not. The spleen is occasionally enlarged. The urine contains bile and sometimes shows signs of irritation. The stool frequently is clay colored, but is occasionally bile stained. Those cases developing acute yellow atrophy usually run an acute stormy course with severe vomiting, rapidly developing coma and death in a few days, as the following case which I treated at the Carney Hospital:

> Female. Age 28. Secondary syphilis, with rash, sore throat and headache. Three doses of neosalvarsan, each 0.9 g., at weekly intervals, followed by two injections of mercury and mercury pills. Slightly less than three months after last dose of neosalvarsan she showed slight jaundice, which was very marked a week later. Vomiting severe. Coma developed and death occurred fifteen days after onset of jaundice. Postmortem at the Boston City Hospital (record given me through the kindness of Dr. F. B. Mallory) showed acute yellow atrophy of liver, fatty degeneration of the heart, early bronchopneumonia, slight ascites, extensive general ecchymotic hemorrhage into mesentery and in one island of Langerhans of pancreas.

Without going into details, it seems fairly well established that the arsphenamine has a part in the etiology of these cases of late jaundice. Scott and Pearson claim[10] that the preceding syphilis has caused some damage to the liver cells, which gives a predisposition to later damage. Pulvermacher[11] and Zimmern,[12] after a very exhaustive discussion, think that the arsenic deposited in the liver is the main factor, but that it is made active by other conditions, such as catarrh of the stomach or duodenum or an achylia gastrica, or more commonly through the disturbances of liver function due to the low diet which the patients have had during the war. This question of low diet during the war is hardly applicable in this country, however. It has been pretty definitely shown that syphilis is not a cause in the sense of a monorecidive. The question of the benzol radical of the arsphenamine as a cause is discussed by Pulvermacher, but there is little ground for assuming that this plays any part in the etiology.

In regard to the treatment, most authors agree that salvarsan should be used again in these cases only after a long interval. Rest, diet, and alkaline salts seem to be preferred by most men.

In conclusion, we have in arsphenamine a very powerful drug for the treatment of syphilis, but one which may cause most serious lesions, especially of the skin, gastro-enteric, nervous, and cardiovascular systems, sometimes leading to death. Although some of these disturbances are unavoidable, it would seem that many of them might be averted by care in the administration and careful judgment in regard to the dosage, the intervals between the doses and the total amount given.

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ARGYROL.

BY WALTER B. LANCASTER, M.D., BOSTON.

ARGYROL was introduced in 1902. It was originally made by extracting gliadin from wheat and treating it under pressure in an autoclave, obtaining thereby a white granular precipitate, which is said to be of the nature of a vitellin. When this is combined with silver, the resulting product is a dark brown powder containing 30% of metal.[1] Commercially the so-called vitellin is obtained from serum albumen by hydrolysis.[2] According to Marshall and Neave,[3] argyrol contains 20% of silver, not 30%.

As is usual with a new drug, exaggerated claims were made for the virtues of argyrol. About 1906 several reports appeared which seemed to settle the question of its germicidal powers in the negative. Dr. G. S. Derby[18] reported the results of some laboratory tests. He stated that argyrol was practically inert, its chief virtue being that it was harmless. Staphylococcus aureus in serum would grow after three hours in 50% argyrol. Verhoeff[4] had reached similar conclusions. The committee of the British Medical Association appointed to study the group of silver salts which had become so numerous, made a report[2] in which they said: "Argyrol has practically no bactericidal action whatever. It seems impossible to attribute the good effects which many clinicians have obtained with it to its bactericidal action."

In 1910 Post and Nicoll published in the *Journal of the American Medical Association,* Vol. LV., the results of a study of argyrol. They compared it with nitrate of silver and showed that 1% nitrate of silver was far more effective and powerful as an antiseptic and germicide than a much more costly solution of argyrol. They also pointed out that bichloride of mercury was absolutely ineffective for quick action; for example, on hands, instruments, or field of operation. If their report is analyzed it is found not so adverse as it appears at first glance. Argyrol 50% showed in ten minutes marked diminution in the number of colonies, and in thirty minutes no growth. Bichloride of mercury 1:500 showed the same, *viz.*, marked reduction after ten minutes, no growth after thirty minutes. Bichloride of mercury 1:2000 was less effective than argyrol 10%. Nitrate of silver 1:1000 gave no growth after one minute. The same was true of alcohol 50 to 70%, and of Lugol's solution of iodine in iodide of potassium 1:400. They rate argyrol as far less powerful than nitrate of silver; but do not condemn it as inert, since they show 50% argyrol to be comparable with 1:500 bichloride of mercury, and 10% argyrol with 1:2000 bichloride of mercury.

In addition to these adverse laboratory reports there were some adverse clinical reports, although they were in the decided minority. For example, J. M. Fortescue-Brickdale, in the *British Medical Journal,* September, 1906, says that he thinks a critical study of the clinical reports on argyrol would lead to conclusions similar to those he reached after investigating 40 clinical reports on collargol—evidence not of its value, but of its worthlessness. Some of the members of the American Ophthalmological Society, in discussing the papers of Drs. Standish and Bruns in 1906, were inclined to question the virtues of argyrol from a clinical standpoint.

On the other hand, if I attempted to review the clinical reports *in favor* of argyrol, the mass of material would be excessive and the report tedious. Instead of doing this, let me try to state the prevalent opinion held today as to the merits of argyrol, basing my statement on a fairly representative canvass of recent text books and of well-informed individuals. The typical answer to the question, "What do you think of argyrol?" would be, "I believe that argyrol is useful: clinical experience convinces me of this. I use it a good deal; but I know, of course, that it is almost if not quite devoid of germicidal power, and in a tight place I should prefer nitrate of silver."

In connection with my study of mercurochrome-220,[5] I came across some reports of tests of argyrol which arrested my attention. I will quote two. Dakin and Dunham[6] mention argyrol 5% as killing staphylococcus aureus in 24 hours, the same as bichloride of mercury 1:3000, better than nitrate of silver 1:300, and better than phenol 1:150. Hugh Young and his collaborators report argyrol 10% showing no growth after five hours, using B-coli and S-aureus. Argyrol 1:1000 failed to kill. One per cent. protargol failed after one hour to kill S-aureus. These very competent authors found argyrol to possess distinct germicidal power. To satisfy myself I made a few tests and was surprised to find that even as weak a solution as 10% acting on staph. aureus in serum caused no growth in culture taken after one minute, or even less in some instances.

The matter seemed worth further investigation, so the tests were repeated several times and the technique refined. The following results were found: Tests with 10% argyrol, even in serum where results are less favorable than in water or normal salt solution, gave no growth as quickly as one minute after adding the argyrol to the suspension of staph.-aureus, provided the loopful of the mixture to be tested was transferred directly to the agar tube. It was soon apparent that the appreciable quantity of argyrol transferred to the surface of the agar in making the culture in this manner was inhibiting the growth, and that the negative cultures did not mean that the microorganisms were dead. But, even so, the experiment shows that argyrol had strong antiseptic or bacteriostatic action, even if not germicidal. This calls to mind the history of bichloride of mercury, put forward by Koch as killing microörganisms in strengths as weak as 1:10,000 or even 100,000. Later it was shown that the bichloride had not killed the bacteria, but had only prevented their growth. If an antidote like ammonium sulphide were added in sufficient quantity to combine with all the bichloride of mercury as soon as the allotted time of action had expired, growth would take place. Miss Chick found that 1:500 bichloride of mercury could act on staph. aureus fifteen minutes, and then if an excess of ammonium sulphide or other similar reagent were added, the microörganisms would grow, showing that the bichloride had not killed them, although it had entered into such a combination with them that growth was impossible until the bichloride was removed.

Accordingly it was necessary to eliminate this source of error before attempting to say whether argyrol could be depended on not only to inhibit but actually to kill the microörganisms. If we were dealing with nitrate of silver, a solution of common salt would serve as the proper antidote, since the nitrate of silver would be precipitated in an insoluble chloride. Argyrol is one of the complex organic salts of silver in which the silver atom is not dissociated in solution as a silver ion, but remains so firmly attached to other atoms that sodium chloride will not produce a precipitate, nor will the silver combine with albumen, as in solutions of silver nitrate. For this reason argyrol and similar silver preparations should not be *compared* as to their action with nitrate of silver, but rather *contrasted* with its nitrate salt. The field of action and special virtues of the two are different, and fairly distinct. The nitrate is caustic (due to NO_3 ion); it acts very quickly, but also loses its effect at once in the presence of an excess either of a soluble chloride like common salt or of albumen. Argyrol is not only not caustic, it is not even irritating; it is not rendered inert by serum nor by sodium-chloride. Naturally two substances differing so widely in their properties may be expected to need different concentration of their solutions. The fact that 1% nitrate of silver is a more powerful germicide in water than argyrol in any strength, even 50%, is no reason why argyrol may not be far superior to nitrate of silver for certain other purposes; and this is indeed quite true.

Not knowing any reagent which would render argyrol inert, the only other way to eliminate it was to dilute it so much as to render its antiseptic action probably negligible. The method finally adopted was this: Solutions of argyrol of double the strength to be tested were prepared; also a suspension of staph. aureus in hydrocele fluid. These were kept at 37.5 C.*; 1 c.c. of argyrol and 1 c.c. of hydrocele fluid containing staph. aureus were mixed and the mixture kept at 37.5 C. At suitable intervals a loopful was taken from the mixture and transferred to a sterile tube containing 5 c.c. of sterile salt solution, and thoroughly mixed. This was to dilute the argyrol so that its further action on the microörganisms would be negligible. A loopful from this diluted sample was transferred to the surface of the agar slant and incubated. Tests were made with several different samples of hydrocele fluid and three different lots of argyrol. The argyrol was purchased in original bottles and some of the solutions were prepared by myself. Several different strains of staph. aureus were used.

The results varied within rather wide limits, which, I take it, is not unusual in experiments of this kind. Controls were made from time to time, both to show the presence and approximate number of organisms in the suspension, and to show the absence of organisms in the solutions used for sterile salt solutions.

It was not my purpose to make any exhaustive bacteriological study of the germicidal properties of argyrol—a study which should be left to bacteriologists—but only to make a few tests to confirm either the negative results of Verhoeff, Derby, and Marshall and Neave, or the positive results of Dakin and Dunham, Post and Nicoll, Young and his collaborators.

My findings convince me that the article sold at present under the trade name of "argyrol" is a powerful antiseptic as tested on staph. aureus in serum, or in salt solution, or water; it is effective in strength as weak as 1% or even less. It also has bactericidal power, especially in strengths of 10% or over—the strengths most generally recommended. It is not a rapid bactericide. It must be remembered that comparatively few drugs exist which are bactericidal in strengths that are not too irritating to be used freely in the conjunctival sac. Alcohol, if not over 70% nor less than 50% strength, is far more rapid and sure; but of course cannot be used freely in the conjunctival sac. Phenol in 2 to 5% is far too irritating and caustic to be used in the eye, except in a small way with an applicator. Iodine in iodide of potassium is effective. Bichloride of mercury is very effective as an antiseptic and enters into such combination with bacteria that simple washing does not easily separate it, so that bacteria exposed to its action are rendered practically harmless, although suitable treatment will demonstrate that they are alive and capable of active growth.

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* The temperature is an important factor in bacteriological as it is in chemical reactions.

There is today very widespread belief in the clinical evidence of the value of argyrol in conditions where a drug with germicidal or antiseptic properties would seem indicated. The belief is almost as widespread that the laboratory evidence positively and definitely proves that argyrol has no germicidal power. Any apparent conflict between laboratory and clinical evidence is certain to be explained away sooner or later.

Other attempts to harmonize the apparent conflict of evidence have not been without some success: (a) Duane[7] says: "Argyrol penetrates all the recesses of the conjunctival sac, lodges in them a long time (so as to produce a continuous action), and as it gradually exudes drives before it the secretion with its contained bacteria. Argyrol forms coagula with the secretions, thus facilitating their removal by irrigation;" (b) Derby[8] points out that argyrol is remarkably free from irritating properties, hence does less harm than other drugs of its class. Though inert, it is sterile and soothing;[8] (c) Standish[9] says, "My conclusions are that the modern silver preparations (he experimented chiefly with argyrol) are efficient in the control of gonorrheal infection of the conjunctiva, and that *they have greater bactericidal properties in this disease* (italics mine) than the laboratory experiments upon other microörganisms would lead us to expect." (d) Says de Schweinitz,[10] "Some remedies may seem to render the tissues less favorable for the growth of the microörganisms, aside from their germicidal value. Argyrol belongs to this class."

I am sure that conflict between laboratory and clinical evidence cannot continue, since both are trustworthy; and here if not everywhere "all discord is harmony not understood."

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The following table shows some of the results obtained:

TABLE SHOWING RESULTS OF STAPHYLOCOCCUS AUREUS IN SERUM ACTED ON BY ARGYROL 1% TO 20% FOR PERIODS RANGING FROM ONE MINUTE TO TWENTY HOURS.

	Minutes																			Hrs.	
	1	2	3	4	5	6	8	10	12	15	20	25	30	40	45	50	60	75	90	2	20
20%.....				25			4			1											
"		0		0		1		+													
"					25		4			12											
"	4	1	2	1		4	0	1		4											
"		7		10		4															
"								50		16			8		1		0				
"								40					29			0	0				
"															0			0	0		

	Minutes																			Hrs.	
	1	2	3	4	5	6	8	10	12	15	20	25	30	40	45	50	60	75	90	2	20
10%.....					1			0			0			0							
"	+		+	+																	
"						+		+			+		+								
"			+		+			+		+	+					0		0		0	
"					+		0			+	0			0							
"										6						0	0				0
5%.....						+			+		+			0							
"														0			0			0	
1%.....																					0

Numbers = Number of colonies after 24 hours' incubation.
+ = Growth; number of colonies not recorded.

0 = No growth.
Controls showed about 50 colonies.

THE RELATION OF FOOD TO INFANTILE ECZEMA.*

BY EDWARD SCOTT O'KEEFE, M.D., BOSTON.

THERE has been for many years a certain amount of recognition of the part played by foods in the causation or at least in the aggravation of eczema. This recognition, in the past, took the form of limitation of fats in the diet or exclusion of some cereal, the favorite being oatmeal. Recently the cutaneous food tests have been introduced and developed by numerous workers[1] in an effort to determine in a definite manner what relation may exist between foods ingested and certain affections of doubtful etiology. In this connection much attention has been given to bronchial asthma, less to eczema, urticaria, and kindred skin conditions.

The relation between a faulty diet and eczema is not a patent one, unfortunately for the infant. There is a tendency among mothers and to a less extent among physicians to put the infant upon a too liberal diet. This results in many cases in a digestive upset which teaches caution. At other times the results of the indiscretion are less obvious. The child may handle the new food without vomiting or intestinal disturbance. The microscopic examination of the stools may show no abnormality. The indigestion, however, is present and shows itself in a masked and often unrecognized form as an asthma, eczema or urticaria. These cases are as truly suffering from indigestion as are those showing the gastric and intestinal symptoms so common with faulty feeding.

We have in this type of case all the factors necessary for protein sensitization. To produce the anaphylactic phenomena it is necessary that unbroken, that is, undigested, protein molecules enter the circulation. To do this the protein food must be of a nature to resist the digestive juices and to remain chemically intact during its stay in the stomach and intestines. Such is the situation when the feeble digestive juices of an infant are too early taxed with the digestion of unsuitable foreign proteins.[2]

There is a failure to recognize that the infant's digestive apparatus has limitations which are much lower than those of the adult. The proteins, which adults ingest in their daily life, are those which are susceptible to the chemical attacks of the gastric and intestinal juices and are called digestible foods. Those substances which in general cannot be so broken down, have been eliminated by experience of the race or individual and are either never considered as food or are recognized as difficult of digestion and are avoided. The diet is adapted to the adult's power of digestion; in the infants, such adaptation is recognized as desirable, but is frequently not attained. The average mother has a confused idea of what to give and at what age to give it. Many physicians are but little less hazy upon the time and sequence of cereals, vegetables, eggs, etc. From such ill adaptations of the diet to the infant many of the cases of food sensitization result.

I have to report upon seventy cases of eczema as influenced by diet. The majority of these cases were seen first at the Dermatological Out-Patient Department of the Massachusetts General Hospital and referred to the Children's Medical Out-Patient, where they were studied and their feeding regulated. The cases were then treated jointly by the two above mentioned departments.

The plan followed was, first, a general physical examination, then a careful consideration of the child's diet, or of the mother's diet in the breast fed infants, and finally cutaneous food tests. The dietary history afforded an opportunity for regulation of feeding in general and also frequently gave suggestions as to possible offending proteins. In making the cutaneous tests linear scarifications were used. Only those tests showing a well defined erythema and wheal were considered positive. It was found more practicable to do the tests upon the back than upon the forearm, as is usually done in adults. All the children were under four years, and the majority were under two years of age.

Consideration of the table shows that 41% of these cases gave a positive reaction to one or more of the food tests, 12% showed a doubtful reaction, and the remainder were negative to any of the proteins tried. There is no doubt that positive tests would have been obtained in some of this negative group if opportunity had been given to test for a greater number of proteins. This was not possible in some instances, owing to the failure of the parents to return with the child, as requested.

Egg proteins gave a positive reaction in 30% of the cases upon which they were used, potato

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* From the Children's Medical Department, Massachusetts General Hospital.

Below are tabulated the results of the cutaneous food tests:

Chart Showing Results of Protein Skin Reactions in 70 Cases, Listed Chronologically from June, 1919 to June, 1920.

Case No.	Beef	Corn	Lactalbumin	Casein	Egg	Wheat	Codfish	Pork	Oat	Tomato	Potato	Bean	Pea	Walnut	Human Milk	Rye	Discharged from Skin Room
June, '19																	
1	0	0	0	+	+												D
2			0	0		0											D
3	0	+	0	0	0		0	0									D
4	0	0	0	0	+	0			+								D
5	0		+	+					0	0	0						D
6			0	0	+				0	0	0						D
7	0		0	0	0		0										
8			0	0	0	0	0			0	0	0	0				
9	0		0	0			+								0		D
10	0	0	0	0	0									0			
11	0		+	+	0	0											
12	0	0	0	+	+	0											D
13			0	0	+										0		D
14			0	0	+				+						0		
15			0	0	0												D
16		0	0	+	0				0		+						
17			0	0		±											D
18		0	0	0	0					0							
19			0	0	0	+					+						D
20	0		0	0	0	0									0		D
21			0	0	+										0		D
22			0	0											0		
23			0	0		0											D
24			+	0	0												
25	0	0	0	0	0												D
26	0	0	0	0	±				0								
27	0	0	0	0	+										0		D
28			0	+		0											D
29			+	+	0												
30		0	0	0	0	0			0			0				0	D
31			0	0	0												
32			0	0													
33	0		0	±	0				0								D
34			±	0													
35		0	0	0	0	0				0		0					D
36			0	0	0	0			0								
37			0	0	0	0			0								
38	0		0	±	0	0			0		0						D
39	0	0	0	0	+	0		0	0		0						D
40			0	0		0					0						

in 20%, casein in 16%, cod fish in 12%, lactalbumin in 11%, wheat in 9%, and corn in 5% of the cases upon which they were used.

The mother in no instance showed sensitization to the protein to which her child reacted. Ten nurslings were negative to the proteins of human milk. Nearly 20% of the series gave a history of asthma, eczema, or urticaria in some other member of the family. In several of the families one child after another developed eczema as soon as it was weaned. An exacerbation of the eczema was in many instances coincident with the eruption of a tooth.

Treatment. Each child was placed upon a diet suitable for its age. The nursing intervals and diet of the mother were adjusted in the breast fed. This included the elimination or reduction of any article in the maternal diet to which the infant was found sensitized. In the case of the other children the offending protein was eliminated from their diet if practicable. This could not be done in the instances

Below are tabulated the results of the cutaneous food tests:

CHART SHOWING RESULTS OF PROTEIN SKIN REACTIONS IN 70 CASES, LISTED CHRONOLOGICALLY FROM JUNE, 1919, TO JUNE, 1920 (*concluded*).

CASE No.	BEEF	CORN	LACTALBUMIN	CASEIN	EGG	WHEAT	CODFISH	PORK	OAT	TOMATO	POTATO	BRAN	PEA	WALNUT	HUMAN MILK	RYE	DISCHARGED FROM SKIN ROOM
41	0	0	0	0	0	0	0	0	0								
42			0	0													D
43	0		0	0	0	0			0		±						
44			0	±	0	0			0		0						
45			0	0		0			0								
46			0	0	0				0								
47	0	0	0	0	0	0	0	0	0		0	0	0			0	
48			0	0	0												
49		0	0	0	+	0			0								D
50			0	0	+	+		0	+		+						
51			+	+													
52	0	0	0	0	0	0	0		0		0	0	0				D
53			0	0	+										0		
54			0		+	0			0								
55	0	0	0	+	+	0	0	0									
56		0	0	0	0	0			0								
57	0		+	0	0										0		
58			0	0	0			0			0						
59	0		0	0	±												
60			0	+													
61	0		0	0	0												
62			0	0	0	0			0		0						
63			+	+	+												
64			0	0	+												
65			0	0		0					0						
66			0	0	±						0						
67			0	0	0						0						
68	0		0	0	0												
69			+	±	+	+			±		+						
70			0	0	0	0			0		0						
June, '20																	
Positive	0	1	8	11	17	3	1	0	3	0	4	0	0	0	0	0	
Negative	25	18	61	54	35	28	7	7	22	5	15	5	3	1	10	3	
Doubtful	0	0	1	4	3	1	0	0	0	0	1	0	0	0	0	0	
Per cent. of positive reactions	0	5	11	16	30	9	12	0	12	0	20	0	0	0	0	0	

Cases marked (D) in last column were discharged from the Skin Room previous to June, 1920.
Cases in upper part of column are those seen early in the year, those in lower part of column those which more recently came under treatment.

where milk was the main or sole article of diet. Here an attempt was made to modify the milk in order to secure the most easily digestible mixture for the particular case.

A general scheme of treatment follows:

1. Bottle fed babies.
   a. Sensitized to casein.
      ℞ Whey and cream mixtures.
   b. Sensitized to lactalbumin.
      ℞ Boil milk and skim off coagulated albumin.
   c. Sensitized to both milk albumins.
      ℞ Peptonize the mixture or use formula with low protein.

In all instances the aim must be to adapt the mixture to the infant's particular needs, as shown by dietary history, stool examination, etc.

2. Breast fed babies.
   Regulate nursing.
   Omit from the maternal diet any article of food to which infant is found sensitized.

3. Children on general diet.
   Regulate to one suitable for age.
   Limit or omit from diet substances to which child is found sensitized.

In some instances withdrawal of the protein which caused a skin reaction seemingly had but little effect upon the course of the disease. At other times prompt improvement followed, and relapse occurred upon resumption of that particular food. Two cases, while under observation, showed positive reaction to casein and later gave a negative reaction, although the eczema was still present, though in a much less active form. This feature might be accounted for by assuming that there is a varying quantitative factor in the protein cutaneous test. Early in the disease a cutaneous response may be obtained by a smaller amount of protein than will suffice later in the case.

It is a fair presumption that some of these cases were sensitized to other than food proteins. One child was negative to all food proproteins tried. Regulation of the diet and external remedies did not result in improvement. After the removal of diseased tonsils, however, the eczema vanished and has not recurred. Since cutaneous tests for bacterial proteins were not performed in this case we can only surmise that such may have been the etiological factor here.

Sensitization in the exclusively breast fed infant was an interesting feature of the work. Some of these infants were found sensitized to proteins which they had no history of ever having ingested. One such nursling was sensitized to cow's milk casein. The eczema improved when the milk in the maternal diet was cut down to a pint a day. It was found then that to make up for this diminution in milk in her own diet, the woman had been taking cheese and cream. These were omitted from the maternal diet and the child's skin cleared completely in two weeks. This child, five months later, showed a relapse of the eczema when the mother commenced to wean him and use cow's milk in his diet. At this time he showed a negative reaction to casein. Without knowledge of his history it would have been difficult to have determined the cause of his relapse.

Another child whose mother gave a history of eating large amounts of oatmeal, showed sensitization to oat and egg proteins. The mother was intelligent and was positive the child had never been given either egg or oat in any form. The mother showed no evidence of sensitization to egg or oat and gave a negative test to both these substances. Elimination of these two articles of food did not result in improvement during the month that this case was under observation. The mother then failed to return. It was learned that the eczema had persisted.

Another nursling of six weeks gave a positive reaction to codfish. The mother's diet was said to contain a large amount of fish. This child's skin cleared up when the cod was omitted from the maternal diet.

Three other exclusively breast fed infants showed positive reactions; two to egg and one to lactalbumin. One of the two showing a reaction to egg did not clear up until weaned at the age of one year. The other showed steady improvement when the egg was omitted from the mother's diet and at the end of six weeks was free from eczema. In the nursling sensitized to casein, reduction of the milk in the maternal diet effected some improvement in a month and at the end of another month cleared up entirely and has remained so for over six months, during which time the mother has limited the milk in her diet.

Such findings suggest that foreign proteins may pass from the mother in her breast milk in sufficient amounts to result in sensitization of the infant. A biologic investigation of breast milk might throw light on this point.

Seven cases of this series showed an excess of fat in the stools. Reduction of the fat to within the individual tolerance resulted in each instance in great improvement in the skin condition. Five of these cases were sensitized to casein, one to egg, one showed no cutaneous response to any of the proteins used. In each case a relapse occurred when the fat was again increased beyond the child's tolerance as shown by stool examination. The improvement following a reduction in the fat occurred without any change in the amount of protein in the diet other than that incident to the cream reduction. In these cases the fat was the predisposing factor rather than the causative factor of the eczema. An excess of fat interfered with the digestive processes or with the integrity of the intestinal walls sufficiently to permit undigested protein molecules to enter the circulation. There is no doubt that unsuitable forms or amounts of carbohydrate in the child's diet act in a like fashion to pave the way for protein inroads.[3]

The 41% of positive reactions occurring in this series of eczemas is in striking contrast to the percentage occurring among normal children, in whom Baker[4] reports the incidence of protein sensitization to be an almost negligible factor.

In considering the results of treatment it is difficult to gauge the part played by external therapy. It is always a great comfort to the patient. In some cases, moreover, it seems to be alone sufficient to effect a cure. Theoretically it cannot be considered more than a palliative measure if we are to believe that the disease is a result of food poisoning. I should not care, however, to be deprived of the aid of the dermatologist either in the diagnosis or treatment of the disease.

As an aid to regulation of diet the protein skin tests give information which can be obtained in no other way. These tests do not supplant the older methods of determining what does and what does not agree with a particular infant, but they do supplement such methods. All persistent cases of eczema should have the benefit of whatever knowledge can be gained of their particular idiosyncrasies by this method. It should not be to the exclusion of a careful dietary history and a complete physical examination with especial attention to the stools. All these data are important, because they enable intelligent management of the child's diet.

The intimate relation shown to exist between food and eczema in so large a percentage of these cases justifies the conclusion that dietary regulation is essential in the treatment of this condition.

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OBSERVATIONS OF AN ANESTHETIST.

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THERE was a time when the administration of an anesthetic was not held to be much of an art and almost anybody was considered fit to render a patient unconscious for operation. The surgeon did not hesitate to allow a nurse or a medical student inexperienced in anesthesia to etherize for him, and many a layman will boast of having etherized his wife while the doctor performed an instrumental delivery. In busy hospitals, an orderly with an ether soaked cone and a strong hand would knock the patient unconscious, and the only answer to the patient's protest was a few more strong hands pinning him forcibly to the table.

Happily times have changed, and not only has the value of the skilful anesthetist become recognized by the profession, but the public also has become educated to the point where they demand special training of the physician who is to anesthetize them. To the patient the unpleasant part of the procedure is the induction of the anesthesia, which he dreads often more than the operation itself. It is therefore no wonder that specialists in anesthesia make a great appeal.

The value of a skilful anesthetist has so demonstrated itself that at the present time there is no well established hospital in this part of the country without one or more anesthetists on its staff, and there is no active surgeon who has not attached to his operating team some especially trained anesthetist. Not only is sound training in the administration of an anesthetic essential, but good judgment must be exercised in selecting the anesthetic for the particular patient. It is therefore safe to assume that anesthesia has become a well recognized specialty.

From this point of view I have kept accurate records of my cases at the Beth Israel Hospital in the hope that by study and comparison I might be able not only to improve my own knowledge and technique, but also to offer some suggestions of value to others.

During the year 1919 there were performed at the Beth Israel Hospital three hundred and ninety-nine major operations. Of that number ninety-one were anesthetized by different members of the staff, and eight by Dr. A. W. Dodge, who is the consultant anesthetist of the hospital. Two hundred were done by myself, and the rest by internes of the hospital, under my supervision. I shall report only on my own cases and those of the internes, altogether three hundred cases. The record form that we employ at the hospital is complete, as well for the preliminary examination as for the anesthetic period and the complications.

The ages of the patients varied from two years to eighty-four. The average age was thirty-six. The operations were chiefly abdominal, but there were a large number of pelvic cases and quite a few prostates. We have no out-patient department and therefore there is no minor surgery. The longest anesthetic time in this series was three and one-half hours. Of all the three hundred cases there was no fatality directly due to the anesthetic.

The methods of anesthesia were as follows: 201, straight ether; 74, gas induction followed by ether; 12, gas-oxygen; 10, spiral analgesia; and 3, local, assisted by ether.

I have divided my cases into four classes, and under "Comment on Anesthesia," I noted on the ether chart: for first class, "Anesthesia very successful"; second class, "Anesthesia successful"; third class, "Anesthesia poor"; fourth class, "Anesthesia very poor." If a patient went under the anesthetic smoothly without vomiting or struggling, was well relaxed for the operation, had good color all through, came out with a good slow pulse and only vomited once or twice soon after the operation, my comment was, "Anesthesia very successful." Should the patient vomit at the time of induction or be poorly relaxed at any time during the operation, or should he be slightly cyanotic, the comment was "Anesthesia successful." If, on the other hand, I had great difficulty in getting the patient to breathe right and if he had a poor color and was not well relaxed, my remark was, "Anesthesia poor." Should the patient stop breathing at any time, requiring artificial means of resuscitation, such a case I designated as "Anesthesia very poor."

Of the two hundred and one cases of straight ether one hundred and thirty-two, or 65%, were of the first class; fifty-six, or 28%, were of the second class; ten, or 5%, were of the third class; while three cases, or 1.5%, were in the fourth class.

An entirely different picture is presented by the cases where gas was used for induction. Of the seventy-four such cases, sixty, or 81%, were in class one; twelve, or 16%, were in class two; while there was only one each for the last two classes. The advantage of gas as a preliminary to ether anesthesia can readily be seen by comparing these figures.

Of the twelve cases of gas-oxygen, eight were in class one, three in class two, and one in class three. Of the three cases of local, assisted by ether, two were in class one, and one in class three. Of the ten cases of spinal, all were in class one.

Since January 1, 1920, our series of cases of spinal analgesia has increased considerably. I shall have more to say on this subject at a future time, when the number of cases will be large enough to draw correct conclusions. As a passing word I wish to state that for the aged and infirm, or those afflicted with disease of the lungs, heart, or kidneys, we have found spinal analgesia to be the anesthetic of choice.

In this series of three hundred cases there were four complications which were directly due to the anesthetic; one lobar pneumonia, one bronchopneumonia, one lung abscess, and one parotitis due to pressure on the parotid gland while trying to keep the lower jaw forward. There were four cases of mild conjunctivitis which cleared in a few days under treatment.

With reference to the two cases of pneumonia, I believe there were other contributing factors beside the anesthetic, as for instance in the case of a woman who was coughing before operation and who on the third day developed lobar pneumonia, affecting the lower lobe of the right lung. She was operated upon as an emergency and had the gall bladder removed. It is possible that on account of pain in the incision and pressure of the wick directly under the liver, this rather obese patient could not inspire deeply with her right lung. The consequence was a congestion and a clogging up of the aveoli with a resultant pneumonia.

Altogether there were four patients who stopped breathing and became cyanosed during the operation. I tried to determine the cause for the accident in each case, but was unable to discover any in two cases. In one case the patient was over-etherized, as could be determined by the markedly dilated and fixed pupils. The fourth case is worth describing in detail. This was a man of about forty-three, who was to be operated on for inguinal hernia. He was a mason by trade, and probably alcoholic. This was a case of straight ether. His aversion to the anesthetic was manifested by general twitching and stiffening of the body, what is termed an "ether clonus." His body shivered as in an ague, and there was a peculiar twitching of the muscles of his arms, legs and face. His color was poor from the start, although he took fairly deep breaths and there was no obstruction to respiration. I began to push the ether so that his pupils became widely dilated; but the more ether I gave him, the more his body shook, and it did not stop even after twenty minutes had elapsed. I then decided to use a little chloroform which I poured on the cone by the drop method. After I used about one drachm of chloroform, the twitching stopped, and I wheeled the patient into the operating room. I continued the ether slowly. After the surgeon made the incision, before he was ready to expose the sac, I noticed that the patient was getting blue. I immediately stopped the ether. The patient in the meantime stopped breathing entirely and his pulse was not perceptible at the wrist. I ordered an ampule of camphor-in-oil and pulled his tongue out. This did not improve his condition. I then resorted to artificial respiration, and gradually he began to come back. The operation was completed, but the patient remained cyanosed and rigid throughout.

The accident in this case, I thought, was caused by the chloroform. But here I wish to remark that this patient did not have any preliminary medication of morphine and atropin. Had he received the preliminary hypodermic, he perhaps would not have come to all this trouble.

I have had considerable difficulty in trying to establish from my records a standard for the pulse and respiration under anesthesia. Here I was confronted with a conglomeration of figures which could not determine any definite law as far as the anesthetic is concerned. I found the widest variations, according to the length of the anesthesia, its depth, preliminary medication, the character of the patient, and the the severity of the operation. As a rule, a prolonged anesthesia raises the pulse and respiration; the same is true of rough manipulations by the surgeon. On the other hand, some nervous patients who have a pulse of 120 before operation come down from the operating room with a pulse of about 70-80 after operation.

In regard to morphine and atropin as a preliminary to anesthesia, I wish to state that although it should never be used as a routine, in the majority of cases it is of great benefit to the patient as well as the anesthetist. It should not be used in the aged, debilitated, and the very young. But, on the other hand, it is of great advantage to the shocked, highly nervous, asthmatics, and robust. It lessens shock, it diminishes the time of induction, and less ether is required to keep the patient well relaxed for the operation.

So much for the preliminary treatment. Now, as to induction, the use of gas as a preliminary to ether is one of the greatest additions to the field of anesthesia. Not only do we save time at the induction, but we do away with any struggling or opposition on the part of the patient in the etherizing room. It is pleasant to take, and once the patient is rendered unconscious by the gas, we can easily switch over to ether without the patient recognizing the change. It also does away with the gagging which occasionally occurs at the time of induction.

In conclusion I wish to give a few practical points as observed from my own experience. Above all, I cannot emphasize too strongly the importance of the utmost concentration of the mind of the anesthetist on his patient. He must be on the alert all the time. The patient's color, breathing, pulse, and the size of his pupils are things that the anesthetist has to be posted on at every moment of the operation. He must also be familiar with all kinds of operations and their different stages. An operation on the gall bladder or a pelvic exploration requires a deeper anesthesia than an appendectomy or an umbilical hernia. Moreover, the different stages of any one operation require varying depths of anesthesia.

It should always be the aim of the anesthetist to use as little of the anesthetic as possible. He must be able to tell at a glance how deep the patient is anesthetized, and for this purpose I know of nothing more instructive than the respiration. It is impossible for me to describe the different characteristics of respiration by which I am able to tell the depth of the anesthesia. This cannot be learned out of a book; one must acquire it by experience.

Another point which is of great importance is the color of the patient. One must never be satisfied with a poor color unless the patient is suffering from asthma. In about 99% of cases cyanosis means either too much ether or mechanical obstruction of the respiratory tract. Be prepared with a nasal tube for every patient who has a short neck, and use it in every case where you have trouble with the patient's breathing. It saves you the necessity of continually holding forward the patient's jaw. Have the head and shoulders of asthmatics higher than the rest of the body. Keep the head of short-necked people in extension.

If the surgeon remarks that the patient is rigid, never, in the desire to quickly deepen the anesthesia, pour an excess of ether on the cone all at once. The concentrated vapor inhibits the patient's respiration with the result that less ether gets into the circulation and he is likely to gag and remain rigid. It must be done slowly at the expense of a little time. If the anesthesia is so deep that the breathing becomes slow and shallow, it means that the patient is approaching a stage when he will stop breathing altogether. Stop the ether at once and wait until the respiration becomes deeper and more frequent.

There is one more important thing which contributes towards good anesthesia and which is frequently overlooked. That is the gaining of the patient's confidence. Don't enter the etherizing room and without preliminaries of any kind start the anesthetic. First get into a conversation with your patient, become acquainted, listen to his heart and count his pulse rate. Show the patient that you are there for his interest and encourage and assure him that everything will be all right. This will overcome his fright and inspire confidence, with the result that he will take the anesthetic more smoothly and will be better relaxed for the operation.

Last of all, don't consider your job finished when the surgeon gets through with the operation. You must see the patient safely in bed. During the recovery he may vomit and aspirate some of the vomitus, which may result in pneumonia or lung abscess, or his tongue may drop backward, causing asphyxia. You should see that all the moisture is wiped off his body and that he is well covered before he leaves the warm operating room for colder corridors and elevators. When put to bed, see that his head is placed in the position in which breathing is accomplished with the least exertion.

The source of success lies in paying attention to a multitude of details which, if kept in mind, will insure satisfaction and safety.

LONGINGS OF THE PREGNANT, VIEWED IN LIGHT FROM THE EAST.

By Alfred Ela, Boston.

Sufficient warrant for taking up this subject is given by the point made in a discussion in 1918 before the Pittsburgh Academy of Medicine,[47] to wit:[39] "It is important that the physician should be versed in obstetrical superstitions in order that he may be in position to deny them and thus assist the patient." Prominent among such superstitions are the longings[46] (cravings, or peculiar yearnings) of pregnant women. From early times[24] these longings have been divided (especially as to abnormal appetites) into (a) the natural and healthy, and (b) the unnatural, revolting or pathological. The latter division seems the only one set out in the textbooks, and apparently it is there treated sufficiently; accordingly, the first class only needs to be considered here. Giles,[23] while ascribing a large portion of the "natural" cravings to superstitious grounds, attempted to account for part as fulfilling some physiological want in food or drink; his opinion, however, can be looked at askance, for he had not yet rid himself of the popular belief that non-satisfaction of longings of that kind might result in a "longing-mark"[40] or birth-mark; this belief goes further, *viz.*, that if such a mark does not appear, the mark has 'fallen on the child,[24, 26] so that it must be fed with the food longed for, however dangerous and inappropriate to its age. The hazard of inflicting birthmarks was a chief instrument in well-meant pressure on a primipara[2, 3] who declined to have longings, according to her sprightly and detailed account sketched hereinafter; suffice it here to say that she was hounded by her solicitous family to have some longings, till she finally was converted into a firm belief in them and that non-satisfaction of them was followed by birthmarks; so she, after account of her own happy delivery, alleges[1] the following instance in the family of de Buffon, a sceptic thereon, who found his mistake to his sorrow. When the pregnant Mme. de Buffon's cravings were for strawberries, then out of season, he made her (a martyr to an experiment) gaze daily on green ones ripening all too slowly under glass; their child was born with a fine strawberry upon an eyelid, according to a prelate's lively report to Bonaparte, then First Consul and interested in such matters.

While this venerable fallacy of birthmarks or maternal impressions is called "hopeless,"[48] it has been attempted to be explained[45] on the rational ground that the foetus has made the mother sensitive to certain impressions, and not *vice versa*; but in this (as in other articles[37] on the results of the internal secretions) the verdict runs ahead of the evidence. That mental troubles (such as certain classes of longings) are connected with the endocrine system is extremely probable, but this remains to be worked out.[29] The problem of the physiological part of the origin of longings, cannot now be solved by ascription alone to alterations in the secretions of the alimentary tract due to pregnancy, as was thought a few years ago;[8] but the legal necessity of the woman's keeping control of the part within her power, has (with the decrease in belief in the superstition that injury results from denying longings) become so evident that few or no cases alleging longings are to be found in recent court decisions,[7] though prosecutions, for larceny, etc., by the pregnant, were formerly rather common.[38]

Most of the above, however, with the fine-drawn division into classes[20] by the authors cited and referred to, may be rendered obsolete by the recent investigations into hysteria which may well include all classes of longings among its symptoms. Under the newest definition:[30, 32, 35] "Hysteria is a condition in which symptoms are present which have been produced by suggestion and are curable by psychotherapy," may come the Duchess d'Abrantès' personal experiences[2, 3] which are related so graphically (pleasure and profit being promised anyone interested who will read the original) that her account, however untechnical in language, might almost serve as a clinical report of a case of "suggestion." Briefly, her first pregnancy had its agonies aggravated by insistent demands of her mother, mother-in-law, and husband that she have some longing, but this she was unable for a long time to evolve. Finally another member of the family joined the chorus, with so many dreadful details of monsters and infants with birthmarks produced by those who had not declared or satisfied longings, that "it would have needed a head stronger than that of a Christian woman carrying her child according to the will of God, not to have surrendered to this line formed by the most true and tender interest."[4] At last she succeeded in achieving a longing for a pineapple, a fruit which she (even in her position in society) had never seen, which then was far more rare than now, and at that date was out of season. She ended by persuading herself that she must either satisfy this new-found desire or die from being unable to eat anything unless this first,[5] and thus brought herself within sight of that starvation which Hurst thinks the real cause of the symptoms hitherto regarded as the toxemias of pregnancy.[31] Fortunately a pineapple was eventually procured, but, being advised not to taste of it till the next day, she caressed it on its stand all night; thereafter being daintily served with it by her beloved husband, she suddenly acquired such a repugnance to it[6] that neither then nor during the rest of her lifetime was she willing to eat of this fruit, though delighting in pineapple in other forms. Was this unconscious autopsychotherapy (spontaneous revolt against the suggestion forced upon her), followed by a hysterical survival?[35] This case was of one unusually resistant to pressure made with the best intentions, while similar "suggestion" oftentimes may be malevolent or thoughtless, being made by women who "seem to take peculiar delight in telling all the horrible things they can think of to their pregnant friends,"[43] who are at that time "unduly impressionable." This leads to what is miscalled "autosuggestion"[25] but is really suggestion from environmental pressure. How effective such pressure may become is shown by longings for unwonted food felt, among certain tribes, even by the husbands[43] (and likewise, momentarily, by General Junot, the husband of the Duchess).[5] Such a longing is in strict analogy with the much discussed "couvade," wherein many of the discomfortures of childbirth are suffered by the father who receives most of the care otherwise given to the mother. An article on this subject, based on a clinical case in New York State, has been for two years under way till it was halted because my structure would not hold together—a defect apparently obviated by the new version of hysteria which supplies the missing keystone to the arch. Autopsychotherapy, on the other hand, seems to be acquired by women in the course of repeated childbirths so that, for instance, a table made up of 300 cases[26] showed that the heavy percentage of married primiparae who manifested longings, evidently as having been taught that this was the proper thing for them to have, steadily decreased almost to the vanishing point after many confinements. This is parallel to the similar cure[46] of paralyzed patients (made by themselves, when perhaps incurable while relying upon the aid of others without giving their own assistance); this cure was through their making instinctive movements largely induced by the buoyancy (physical and mental) found in the swimming bath, of which the therapeutic use in this connection has been lately learned and which has proved of incalculable value.[46]

Which side of the shield bears the true blazon must be adjudged by a more competent investigator. It is hoped that this determination will be incidental to the intensive study of the unique psychic state of pregnant women, the lack of which has already been lamented.[27] Meanwhile, great present interest is excited by the flood of unexpected light thrown upon the subject[9] by a marshaling of material from the East, derived from a civilization unbroken and so far older than ours, and of a people perhaps more acute mentally than are Occidentals. The material from the East, as thus selected, does not pretend to be scientific, but it is ample in volume because Hindu women evidently have longings much more urgent and universal[12] than are found in the West. These longings are fostered by the seeming necessity of yielding to them, since they are thought to originate,[11] not with the woman herself, but with the child she carries, whose welfare (like that of the community) would be imperilled if its wishes were thwarted. This theory of "two-heartedness,"[11] as it is called, differs utterly from the Greco-Roman doctrine that the child had no separate existence till it was severed from its mother; further researches (regarding the reciprocal interchanges of religious ideas between India and the early Roman Empire) may show this theory as the real source of the Church's doctrines on the sinfulness of abortion; but a discussion of this side issue must be postponed.

While in the West most of the "evidence"[36, 41, 42, 44] is untrustworthy, sporadic and unsystematized, "Hindu schematism allows nothing in nature or the mind, however unimportant or indecent it may seem to a sophisticated Western soul, to pass without formal statement and discussion."[10] The unconscious manifestation of this tendency by the fictionists, as to Dohada or longings, "pervading poetry and fiction all the way from Ceylon to Tibet,"[10] has in the last-cited article been reduced to form under six rubrics, to wit:[13]

"I. Dohada either directly injures the husband, or impels some act on his part which involves danger or contumely.

"II. Dohada prompts the husband to deeds of heroism, superior skill, wisdom or shrewdness.

"III. Dohada takes the form of pious acts or pious aspirations.

"IV. Dohada is used as an ornamental incident, not influencing the main events of a story.

"V. Dohada is feigned by the woman, in order that she may accomplish some purpose or gratify some desire.

"VI. Dohada is obviated by tricking the woman into the belief that her desire is being fulfilled."

The space available here will not permit giving details under these rubrics except by a few brief comparisons; thus, as to the first rubric, if one had a patient[22] who, like a very vampire, sucked the blood of her sleeping husband, it might be profitable to adduce the case of a king who willingly gave of his blood to gratify a foetus who he knew would finally slay him.[14] If she had a yearning even to eat his flesh,[21, 50] Hindu instances showed the woman satisfied, though she was tricked.[15, 16] Rubric III has many examples[17] which can scarcely be matched in the less pious West, but which might be paralleled by many a Christian saint having been sanctified *in utero matris*. Under IV, two of the women[18] gratified their longing to roam aloft in an airship, a longing which can be matched by the similar "symbols" in the desire-dreams collected by our psychoanalysts. The whole matter of Dohada is pervaded by evidences of infinite solicitude in pre-natal care (for instance as to diet).[19] Still further afield, in the frequent themes of the Hindu poets[10, 12] that the blossoming and the fruiting of various trees are dependent upon the gratification of their peculiar longings, are even much-needed variants for our poets of Spring.

A summary of the present situation may be made by stating that whether the origin of longings is physiological, or hysterical in its new meaning, must await someone's intensive study of the psychic state of pregnant women; meanwhile attention is called to Professor Bloomfield's recent digest of many aspects of the question in the literature of India.

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Medical Progress

REPORT ON PSYCHIATRY.*

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PSYCHIATRY AS AN AID TO INDUSTRIAL EFFICIENCY.

BALL[1] shows the great value of mental hygiene in the industries. He bases his conclusions on the results of visits to large industrial plants in various parts of the country, interviews with managers and men, and much detailed study of individual workmen. He believes in close relationship between employer and employee and the stabilization of industry by practical scientific selection of human material, creating trust, confidence and coöperation. To this end it is necessary to study the individual as to his physical, nervous and mental fitness for his job, and to ascertain his special abilities and disabilities. Prophylactic measures adopted now, with the sympathetic coöperation of labor and industrial leaders, will prevent the disease of inefficiency from making further inroads upon either capital or labor, stabilizing and unifying both. The present industrial research—not only scientific in aim, but practically humane and economic—is the preliminary stage of a work which, he believes, has not previously been attempted.

The methods of procedure include (1) general medical, (2) neurological, (3) psychiatrical, (4) psychological, and (5) social, since the scheme involves the coördination of all scientific aids in industrial examinations. Such a scheme could be put into operation in the employment bureau of industrial organization, and also used to ascertain the physical, nervous, and mental equipment of workers already employed.

As an example, the results of an examination of fifty-seven employees of an industrial company is presented shortly before a strike occurred. All the strikers were found to have something wrong with them from a nervous or mental standpoint, nearly all having a psychopathic history. Such an examination, it is claimed, is of value in predetermining conduct and enabling the employer to remedy conditions likely to cause trouble.

He concludes that it is desirable, even from an economic point of view, to establish medico-psychological laboratories as the principal de-

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partment of employment bureaus of every large industrial organization, and further advocates the establishment of a central employment clearing house, with medico-psychological laboratory to act for groups of industrial organizations too small to economically conduct their own bureaus. There would be a representation of labor in all such bureaus, which would react to the benefit alike of the individual, the industrial organizations, the labor organization and the community.

Southard,[2] commenting on Ball's statement, adds in a comprehensive paper on the subject, that of course no mental hygienist would assert that all or many strikes could be prevented by advance studies of workmen. In fact, Ball specifically says that "it could not be concluded from this or any other examination that all strikers, whether agitators or not, are psychopaths; examination does show that the agitators in this group were the self-assertive ones and the ones grading the highest in intelligence, the others simply followed the leader." Nobody needs to say that there are not strikes and other labor troubles due to mental disease or character defect, either in the employment managers and mind executives or in the plant owners themselves. Some of the very conditions which make for self-assertiveness and success of a sort amongst labor leaders are conditions which make for the success of financial magnates and captains of industry. Nobody claims 100 per cent. efficiency for any of these or kindred proposals.

Cobb[3] sums up the problem of industrial psychiatry as follows:

Prophylaxis of mental breakdowns by adapting the worker to his environments, and eliminating causes of discontent.

Treating psychiatric cases when they arise in a rational way according to the facts of each case, and considering as psychiatric phenomena many forms of behavior that until recently have been given unsympathetic names, *e.g.*, "the groucher," "the kicker," "the trouble maker," and "the hobo."

As conditions are at present, a reasonable application of psychiatry to industry would seem to be the following:

1. Physical examination of all applicants for work.
2. Mental examination by (a) a period of training and observation, or (b) through mental tests.
3. Keeping in personal touch with employees' individual problems by means of (a) good foremen, (b) a system for watching individual efficiency, or (c) a sympathetic staff with a psychiatric point of view in the employment management office, thus salvaging the men who might otherwise be fired.
4. Training the industrial physician to a knowledge of how human nature is constituted, not in conventional terms, but in the light of a dynamic and living psychology that considers the behavior of human beings in terms of instinctive sources of energy, integrated into motives, these motives needing outlet through energy transformation into satisfactory activity.

PROMOTION OF MENTAL HYGIENE IN UNIVERSITIES.

Campbell[4] emphasizes the following points:

1. The lack of guidance in childhood, adolescence, and early adult life is one of the causes of the development in the adult of a great variety of nervous and mental disorders, varying from frequent headaches, peculiar mannerisms, anomalies of mood, odd interests and enthusiasms, to disorders of conduct sufficiently pronounced to be called insanity.
2. Those primarily responsible for giving the necessary guidance are the parents and teachers, the family physician and the religious adviser.
3. The parents cannot easily be reached directly.
4. The teachers can take up the problem efficiently only when their own education deals frankly with many problems of life which are too frequently ignored although they are of fundamental importance.

A course of psychology for teachers is quite inadequate unless it deals thoroughly with the basal forces of human nature, with the instinctive roots of conduct, and with the various surface phenomena which crop above the surface when the instinctive life of the individual is being badly managed.

5. The student at the university should not only have the opportunity of developing his intellectual efficiency and of casually deriving personal benefit from frank intercourse with his fellows; he should in every case have a

course of instruction dealing with the fundamental problems of human life, and in this department should find a suitable opportunity for facing his own personal needs and difficulties, and placing his intellectual development on the sound basis of a healthy and clearly understood instinctive life.

6. No medical college is fulfilling its responsibility toward the community unless it provides its students with a satisfactory opportunity of studying mental disorders in their earliest phases, and trains physicians to recognize early and to regard seriously the symptoms of disordered balance in the child and in the adult.

THE MENTAL SIDE OF VASCULAR HYPERTENSION.

Moschowitz,[5] without attempting to determine the "why" of hypertension, has ventured to describe a type of person, conforming to certain physical and psychic complexes, in whom hypertension is very likely to occur. Here is his picture:

> The patients are overweight and sometimes even obese. The neck is short, the muscles are soft, their bodily movements are sluggish, their carriage and walk are ungraceful and they lack the spring and *elan* of the former athlete. Physically, these people are tense; they pursue their vocation with tremendous seriousness and worry over trivialities. Phlegm and hypertension are, in my experience, antagonistic. Furthermore, these individuals have narrow intellectual horizons. Their interest in anything outside of their business is desultory. They have no hobbies.

The prototype of the candidate for hypertension whom Moschowitz has thus cleverly portrayed shows his most conspicuous mental incapacity in an inability to play. If it shall prove of value in prophylaxis to know the type, we must regard him, according to Moschowitz, as the antithesis of the child, both in mind and in spirit. If the psychic, as well as the physical, takes a part in the development of hypertension, we may well advocate, vigorously and often, a large element of play in the routine of those who conform to the type. If age is not merely a matter of years, we must keep alive that spirit of childhood which is not "blighted by the premature struggle for existence or the gloom of a depressing environment." In anticipation of the danger of hypertension we must put back play into the lives of those who know only adult work; for in a well balanced life the spirit of the child, with its humor, imagination, its enthusiasm for sport and love of vacations, furnishes that which "neutralizes the corroding acid of the 'fret and fever' in our lives."

SUPRARENAL INSUFFICIENCY AS A FACTOR IN PSYCHOSES.

Rossi[6] has encountered nine cases in which a manic-depressive psychosis developed during the weakness following influenza. He ascribes it to the suprarenal insufficiency which was manifest. This assumption was confirmed by evidences of suprarenal insufficiency in six other patients with manic-depressive psychoses who had not had influenza. It was placed on a still more solid basis by the efficacy of suprarenal treatment. The beneficial action of epinephrin in these cases seems to lift the veil of mystery from the manic-depressive psychoses, and expose their origin and means to treat them.

INTRASPINAL TREATMENT OF SYPHILITIC DISEASES OF THE CENTRAL NERVOUS SYSTEM.

Lafora[7] now has a record of fifteen cases of general paralysis in which the manifestations of the disease have retrogressed under his treatment, not only the symptoms but the laboratory findings in the lumbar puncture fluid as well. The latter does not occur with the spontaneous remissions in general paralysis. The secret of success, he says, is to diagnose the disease in its earliest phases, before it has been under way for more than six or eight months. This is possible, he explains, by the laboratory findings in the cerebrospinal fluid and blood. Two of these laboratory reactions are characteristic of general paralysis alone, namely, the Wassermann test applied with only 0.2 c.c. of the cerebrospinal fluid, and the special curve of the colloidal gold test, the figure being very different from the figure with other forms of cerebrospinal syphilis. With these two reactions, general paralysis can be detected even before any clinical symptoms become manifest. The intraspinal treatment may arrest it for years, and perhaps permanently. It must be kept up possibly for a year and a half, that is, until the five laboratory reactions are permanently negative. Nine or ten months sufficed in some of his cases.

The same treatment proved almost always effectual in eight cases of tabes, the subjective symptoms rapidly subsiding, with some of the objective symptoms. It also proved the most effectual means to arrest progressive amaurosis, and in syphilitic radiculitis it suppressed the pains much better than intravenous treatment. He gives intravenous treatment in the intervals, testing the susceptibility by gradual therapeutic preparation, both intraspinally and by the vein, as he describes in minute detail. His list includes also four cases of syphilitic spinal and two of cerebral paraplegia. He uses the autoserum prepared *in vitro* by the Byrnes and Ogilvie methods. Four or five injections are made by the vein at intervals of from four to six days, 0.01 gm. of mercury and arsphenamin. The first intraspinal injection was made with arsphenamized serum, never more than 2 or 3 mg., and the maximal dose ever reached was 4 mg. of mercuric chlorid or 7 mg. of (French) neo-arsphenamin. The intervals were from twenty to forty days while the injections by the vein were made about twice a week alternating the mercury with the neo-arsphenamin and suspending for two or three weeks at the end of six months. The efficacy of this treatment is extremely manifest in syphilitic processes which have not yet invaded the deep parenchyma of the nervous system, and meningeal lesions are only just beginning around the nerve lesions.

ORGANIC BASIS FOR DEMENTIA PRAECOX.

C. von Monakow and S. Kitaboyashasi,[8] in pathological examinations of twelve cases of dementia praecox, found abnormalities in the choroid plexus of every case. The lesions included hyperemia, scattered degeneration of the villi, amyloid degeneration of the connective tissue, collection of colloid masses within the plexus and interpapillary exudation. In other psychoses marked by abnormal sensations, delirium, delusions and hallucinations, similar changes were seen but they were of less intensity. In cases of chronic alcoholism and senility only hyalin degeneration and atrophy of the villi were found. Von Monakow believes that it is the function of the choroid plexus to neutralize, detoxicate or transmit the total products of internal secretion so far as these substances have to do with brain function.

PATHOLOGIC CHANGES IN TESTES IN MENTAL DISEASES.

Macroscopically, sections of fresh or hardened testes revealed pathologic changes in a majority of the asylum cases studied by Mott;[9] the converse was noticeable in the adult hospital cases. In the asylum cases the most marked deviation from the normal condition was found in two groups of cases, namely, (1) general paralysis, (2) dementia praecox. There was no correlation between the macroscopic cortical changes in the brain in general paralysis and the morbid changes in the testes. As a general rule, the degree of morbid macroscopic changes of the testes in dementia praecox conformed to the duration of the mental disease and the clinical signs and symptoms of the mental decadence rather than to any obvious macroscopic changes or defects in the brain. In general paralysis, the dementia corresponds in great measure to the degree of cortical destruction; nevertheless, there is no correlation in this disease between the brain atrophy and the testicular atrophy. With the exception of cases of senile dementia and congenital imbecility with epilepsy, the testes in other fatal asylum cases did not, as a rule, show any marked departure from the normal, for example, cases of epileptic insanity, Korsakoff psychosis, paranoia and manic depressive insanity.

"PROGRESSIVE PARALYSIS."

The investigations of Jahnel,[10] which show that ordinarily there were large numbers of spirochetes present in the cerebral cortex of paralytics who had died during an attack, are confirmed by the researches of Jakob and Hermel. The findings of the latter investigators go to show that the exacerbations of the disease, considered from a parasitologic standpoint, constitute very important episodes in the course of progressive paralysis. As the most important results of his investigation, Jakob mentions finding that the mental and motor exacerbations are associated with regressive and progressive phenomena in the fundamental and essential part of the nerve fibres (the axis cylinder), and with severe inflammatory processes in the connective tissue, and infiltration of the pia, the vessels of the cortex and medulla; infiltration of cellular elements into the nerve tissue; collections of lymphocytes; encephalitic processes; occurrence of gummatous changes in the vessel walls, and of miliary gummata in the cerebral cortex. Also endarterial proliferation processes in the vessels of the cortex were noted.

Jakob looks on his histologic investigations as furnishing further proof of the correctness of Jahnel's view that the exacerbations of the disease coincide with a vigorous and extensive multiplication of the spirochetes. So much, Jakob thinks, must be taken as certain, that in progressive paralysis living spirochetes exert a direct effect on the brain.

It is still a question why paralysis develops in certain syphilitics and not in others, although the observation that it is the syphilitics with very slight defense reactions in whom paralysis appears seems to point toward a solution. Further light on the question is thrown by the observations of Erb and of Fournier that those in whom the infection takes a mild course and who present no specific skin lesions in the secondary stage are more prone to paralysis than are those of whom the converse is true. Jakob's histologic data give the clue to treatment of progressive paralysis. Everything possible must be done to effect a cure of the syphilis, to destroy the remaining foci of spirochetes, and to enhance the production of antibodies. He reports that efforts in this latter line are now under way. He is injecting patients by the vein with inactivated serum from untreated patients in the secondary stage of syphilis with pronounced cutaneous manifestations of the disease, hoping thus to increase the supply of specific antibodies. He is also planning to use cultures of the spirochetes for a similar purpose.

MENTAL AND NERVOUS INJURIES.

Donoghue[11] emphasizes the need of calling to the assistance of the compensation boards men competent to diagnose and advise treatment in the psychoses, and through them to encourage the further standardization of this group of cases. The present method of handling them by exerting constant pressure from the insurance physician, insurance adjuster, or compensation commissioner is not always a success. Non-acceptable work forced on a man tends to develop in him the reaction against work. Forcing a high class man to sweep a floor may not be treatment; it may be the opposite. The difficulty of the administration of workmen's compensation by lay boards in this group of cases comes down to the unsurmountable fact that there is no specific treatment for hysteria. When a person presents himself he is coming more for relief than for monetary compensation.

INSANITY AND CRIMINAL RESPONSIBILITY.

A committee of the American Institute of Criminal Law and Criminality, upon Insanity and Criminal Responsibility recommends the adoption of a program for development directed towards the following ends:

1. That in all cases of felony or misdemeanor punishable by a prison sentence the question of responsibility be not submitted to the jury, which will thus be called upon to determine only that the offense was committed by the defendant.

2. That the disposition and treatment (including punishment) of all such misdemeanants and felons, *i.e.*, the sentence imposed, be based upon a study of the individual offender by properly qualified and impartial experts cooperating with the courts.

3. That provisions be made permitting the transfer of such misdemeanants and felons at any time after conviction from one institution to another affording a different kind of treatment upon the presentation of evidence of the needs for such action satisfactory to the court which passed sentence.

4. That no maximum term be set to any sentence.

5. That no parole or probation be granted without suitable psychiatric examination.

6. That in considering applications for pardons and commutation careful attention be given to reports of qualified experts showing the applicant's mental age and mental stability and that in drafting statutes determining or defining juvenile delinquency, mental age and mental stability, within reasonable limits, be regarded as of importance with the calendar age of the delinquent.

In view of the foregoing and as an initial step towards the ends stated, the committee submits the following resolution and urges its immediate adoption:

Resolved, That the several states be urged to make provision for the psychiatric examination, under conditions permitting prolonged observation when necessary, of all persons convicted of a felony, misdemeanor or other offense by properly qualified experts appointed to assist the court in reaching a decision as to the proper disposition and treatment of the offender.

The personnel of this committee was as follows: Victor P. Arnold (chairman), Judge of the Juvenile Court, Chicago; Dr. Hugh T. Patrick, Chicago; Dr. H. Douglas Singer, State Alienist, Kankakee, Ill.; Dr. Sidney Kuh, Chicago; Burdette G. Lewis, Commission on Charities and Corrections, Trenton, N. J.[12]

THE MENTAL DEFICIENCY OF PROSTITUTES.

One hundred and twenty-six women arrested for prostitution and similar offenses at Newport News, Va., were given Binet-Simon tests by Mertz,[13] the psychological examiner at the port of embarkation. The results showed that:

1. Fifty-three per cent. of the women had a mental age of 10 or under.
2. In addition, 15 per cent. of those who were not mentally deficient showed mental disorder.
3. Ten per cent. were so deficient as to warrant, under existing laws, segregation in an institution for feeble-minded.
4. Fifty per cent. of these women did not reach the fifth grade in school.
5. If we were seeking for a "type," we might say that the composite of the delinquent woman as found in Newport News would seem to be a woman of 19, slightly mentally deficient, with schooling to the fourth grade.

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Book Reviews.

Electric Ionization. By A. R. FRIEL, M.D., (Dub.)., F.R.C.S.I. New York: William Wood and Company. 1920.

A practical introduction to the use of electric ionization in medicine and surgery is presented in this small volume by Dr. Friel. The author has explained the general principles of ionization and described methods of utilizing electric currents in introducing drugs into the affected parts of the body for the treatment of disease. A detailed account of the equipment necessary has been given, with explanation of electrical terms, information in regard to available sources and regulation of current, methods of testing electrodes, and a list of solutions which should be kept in readiness in the ionization room. The effects of different ions on ankylosis, cerebral affections, and other conditions are discussed and illustrated by detailed accounts of experiments. Of particular value is the section of the book which mentions some of the conditions for which ionization has been found most useful and describes the technique suitable for applying it to different parts of the body. The author does not claim that ionization is a panacea, but states what reasonably can be expected from it. The treatment has been found to be especially beneficial in the treatment of many ailments whose manifestations are for the most part local and due in many cases to the inoculation of microorganisms into some tissue or organ where secondary organisms find a footing and cause retardation or prevention of cure in the patient. The simultaneous employment of other agencies dealing with other factors of the condition is not discouraged. The book is well illustrated with diagrams and charts which will be found helpful in the successful practice of electric ionization.

Aids to the Analysis of Food and Drugs. By C. G. MOOR, M.A., F.I.C., and WILLIAM PARTRIDGE, F.I.C. Fourth Edition. New York: William Wood & Co. 1918.

The fourth edition of *Aids to the Analysis of Food and Drugs* analyzes the food and drugs which are most commonly sold to the public. Few of the methods of analysis here described are really new, although many processes have been added which have come into more general use since the publication of the third edition. The new regulations and recommendations issued by the Government and foods and adulterants of recent appearance are presented. In this edition, estimates of sulphates, benzoates, hydrogen peroxide, and other preservatives are given; the facing of grains, catalase in milk, and the Kirschner process are described. Fiehe's test for invert sugar, Evers' process for anarchidic acid, Tatlock and Thomson's process for caffeine, and the English fibre process have replaced some of the methods incorporated in previous editions. Other new sections deal with cider, the freezing-point of milk, milk enzymes, self-raising flour, the bleaching of flour, hardened oils, dirt in milk, and unsound fruit in jam. Poisonous metals are considered, together with means of determining traces of lead, arsenic, zinc, and copper. Wherever it has been possible, the alterations made necessary by war conditions in the composition of articles have been enumerated in the appendix.

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INFANT MORTALITY IN THE UNITED STATES.

There has been compiled by the American Child Hygiene Association a valuable statistical report of the infant mortality in 269 cities of the United States. It will be for the interest of the 2,500,000 babies born in the United States each year if government and health officials and citizens, after giving thoughtful attention to a comparison of these statistics, consider the conditions in their own cities and discover the determining health factors in which they are deficient. In the following cities, where the mortality rate is under 50, babies apparently have the best chance of surviving: Brookline, Massachusetts, with a rate of 40; Berkeley, California, 44; Marinette, Wisconsin, 45; Aberdeen, Washington, 45; Everett, Massachusetts, 47; Madison, Wisconsin, 47; Piqua, Ohio, 48; Alameda, California, 49. The health authorities in these cities are to be congratulated and their methods emulated. The ten largest cities in the United States have the following rates: New York City, 82; Philadelphia, Pennsylvania, 90; Detroit, Michigan, 97; Cleveland, Ohio, 91; St. Louis, Missouri, 75; Boston, Massachusetts, 97; Baltimore, Maryland, 97; Pittsburg, Pennsylvania, 115; Los Angeles, California, 67; San Francisco, California, 65.

With the exception of Lackawanna, New York, where the mortality rate is 276, due to the fact that an institution receiving foundlings and dependent infants from one-half of the state is located there, the city having the poorest record is El Paso, Texas, with 245. Other cities where the particularly high mortality rates indicate a need for increased infant welfare supervision are Burlington, Vermont, where the rate is 150; Paducah, Kentucky, 146; Hannibal, Missouri, 145; Ironton, Ohio, 139; Fond du Lac, Wisconsin, 135; Knoxville, Tennessee, 135; East Chicago, Indiana, 134; and Wilmington, North Carolina, 132. Seattle, Washington, Minneapolis, Minnesota, and San Francisco, California, with death rates respectively 54, 61, and 65, have the lowest rates among cities with a population of over 250,000; cities of this size having the highest rates are Pittsburgh, Pennsylvania, 115; Buffalo, New York, 107, and Kansis City, Missouri, 103. Of cities with a population of between 100,000 and 250,000, Houston, Texas, with 61, Oakland, California, with 62, and Cambridge, Massachusetts, with 64, have the lowest rates; and New Bedford, Massachusetts, with 124, Camden, New Jersey, 121, and Nashville, Tennessee, 116, the highest.

Upon the adequate protection of our babies depends the future of our race. If this is to be secured, every city in the country should see that all infant births are registered, that supervision and care are provided for pregnant women, that child health centers are established, that the milk supply is pure, that medical school inspection is instituted in the schools, and that school children are taught health habits. The records achieved by a few cities demonstrate what can be accomplished if proper health measures are demanded and enforced.

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MEDICAL NOTES.

Institute of Psychiatric Research in Germany.—The following observations of a German professor in regard to insanity in Germany have been published in a recent issue of *The British Medical Journal:*

In Germany one person in five hundred requires asylum care; at least twice as many persons suffer from mental disorder in some form. In addition, there is an unknown and uncontrollable number of degenerates engaging the attentions of the police. Asylums are primarily for the care of the insane, and asylum workers are chiefly occupied in clinical and administrative duties and have no time for research. The proper conditions for research work can only be realized in specially equipped institutes adequately endowed. Such an institute is already in being at Munich, and it is expected that money will be forthcoming from private sources to provide a large new building on a site already given by the city authorities. Five departments exist—three for anatomical work and one each for serology and statistical research. Distinguished scientists control the departments and enjoy complete independence. Departments of psychology and biochemistry are projected together with a very complete library. As a result of considerable endowments it is hoped to engage suitable collaborators and to provide facilities for scientific journeys and investigations in foreign countries. Professor Kraepelin sketches a large field for research, including the influence of poisons such as syphilis and alcohol on the organism, and the nature and origin of dementia praecox, epilepsy, and the manic-depressive states. He anticipates that much progress will be made in these problems from researches in serology, biochemistry, and endocrinology. Degeneration presents another wide field in which aid will be sought from large collections of statistics concerning the prevalence of mental disease, epilepsy, deaf-mutism, vagrancy, prostitution, alcoholism, and syphilis. The work was begun in April, 1917, and means are being found to carry it on and extend it, and to link the institute with a new hospital for the insane which the city of Munich proposes to build.

BOSTON AND MASSACHUSETTS.

WEEK'S DEATH RATE IN BOSTON.—During the week ending October 23, 1920, the number of deaths reported was 173 against 175 last year, with a rate of 12.06 against 11.46 last year. There were 27 deaths under one year of age against 30 last year.

The number of cases of principal reportable diseases were: Diphtheria, 49; scarlet fever, 25; measles, 6; whooping cough, 25; typhoid fever, 1; tuberculosis, 48.

Included in the above were the following cases of non-residents: Diphtheria, 15; scarlet fever, 5; typhoid fever, 1; tuberculosis, 9.

Total deaths from these diseases were: Diphtheria, 2; whooping cough, 1; tuberculosis, 9.

Included in the above were the following cases of non-residents: Tuberculosis, 2.

Infantile paralysis cases, 6; deaths, 2.

The Massachusetts Medical Society.

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Obituary.

FRANK WESLEY NOLAN, M.D.

Dr. Frank W. Nolan, aged 52 years, a physician in Greenfield until seven years ago, died at his home in Springfield October 14, 1920. He was born in Springfield and attended the public schools there. Later he entered Yale Medical College and graduated in 1898. He took a postgraduate course in the Charity Hospital in New York.

He immediately began practice in Greenfield and was very successful. His health gave way under the strain and he was forced to travel. For the past seven years he has spent his time largely in an effort to regain his former strength.

He leaves his widow, Anna P. Nolan; his mother, Mrs. Catherine Nolan, of Springfield; a son, Thomas B. Nolan of New Haven, Ct.; a sister, Emma L. Nolan, and a brother, John W. Nolan.

He was not a member of the Massachusetts Medical Society.

Correspondence.

MATERNITY AID.

Fitchburg, Mass, Oct. 23, 1920.

Mr. Editor:—

The President of the Massachusetts Medical Society says, according to Dr. Bowers, that physicians have shown a "lack of interest in the subject (maternity aid) and of coöperation with the commission, which is a reflection on the loyalty or intelligence of the profession, or both." Which one of the two gentlemen makes the remark about the "loyalty and intelligence of the profession" is not quite clear, however.

Last spring a local medical society held a special and largely attended meeting for the purpose of discussing the so-called Spencer bill. The vote in disapproval of the bill was unanimous, and a committee was appointed to attend the hearing at the State House and speak against it. Two of the committee attended, giving up all of one day for the purpose. The entire time of the hearing was taken up by Miss Spencer and her satellites and the committee had no opportunity whatever. The third member of the Committee attended the second hearing at the State House and, after a long wait, was heard only by making a special request and practically insisting. After this experience do you think that, if we have not shown more "interest and coöperation," it should be attributed to want of "loyalty and intelligence"?

Various statements that have appeared in the Journal, and its general attitude and that of the officers of the State Society regarding maternity aid, constitute a very serious charge against the medical profession and one, as I believe, wholly unwarranted and uncalled for. It has seemed that you were more interested in promoting the schemes of a restless woman than in the welfare of the medical profession.

If any legislation is enacted such as was threatened by the Young bill and the Spencer bill, I believe that it should and will meet with such organized and united resistance from the profession that it cannot be carried out. Even if the condition of obstetrical practice in this state is intolerable, as you say it is, surely the control of the entire medical profession by the State Board of Health will be intolerable.

E. P. Miller, M.D.

Miscellany.

UNITED STATES CIVIL SERVICE EXAMINATIONS.

Assistant Field Agent, Protective Social Measures.
November 17, 1920.

The United States Civil Service Commission announces an open competitive examination for assistant field agent, protective social measures, on Nov. 17, 1920, at the usual places of examination. Vacancies in the United States Interdepartmental Social Hygiene Board, in duty in Washington, D. C., and in the field, and in positions requiring similar qualifications, at salaries ranging from $1,200 to $2,000 a year, will be filled from this examination, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer or promotion.

Applications. Applicants should at once apply for

Form 1312, stating the title of the examination desired, to the Civil Service Commission, Washington, D. C. Applications should be properly executed, excludng the medical certificate, and filed wth the Commission at Washington in time to arrange for the examination at the place selected by the applicant.

The exact title of the examination, as given at the head of this announcement, should be stated in the application form.

Applicants entitled to preference should attach to their applications their original discharge, or a photostat or certified copy thereof, or their official record of service, which will be returned after inspection by the Commission.

DIRECTOR OF BUREAU, DIVISION, OR SECTION OF PROTECTIVE SOCIAL MEASURES, $3,500 TO $4,500 A YEAR.

SUPERVISOR OF PROTECTIVE SOCIAL MEASURES, $2,800 TO $3,600 A YEAR.

FIELD AGENT, PROTECTIVE SOCIAL MEASURES, $1,800 TO $2,000 A YEAR.

SPECIAL ASSISTANT AGENT, PROTECTIVE SOCIAL MEASURES, $900 TO $1,500 A YEAR.

Receipt of Applications to Close Nov. 28, 1920.

The United States Civil Service Commission announces open competitive examinations for the positions listed above. Vacancies in the United States Interdepartmental Social Hygiene Board, for duty in Washington, D. C., and in the field, at the salaries indicated, and in positions requiring similar qualifications will be filled from these examinations, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer or promotion.

Applications.—Applicants should at once apply for application form stating the title of the examination desired, to the Civil Service Commission, Washington, D. C.; the Secretary of the United States Civil Service Board, Customhouse, Boston, Mass., New York, N. Y., New Orleans, La., Honolulu, Hawaii; Post Office, Philadelphia, Pa., Atlanta, Ga., Cincinnati, Ohio, Chicago, Ill., St. Paul, Minn., Seattle, Wash., San Francisco, Calif.; Old Customhouse, St. Louis, Mo.; Administration Building, Balboa Heights, Canal Zone, or to the Chairman of the Porto Rican Civil Service Commission, San Juan, P. R.

Applications should be properly executed, excluding the medical certificate, and must be filed with the Civil Service Commission, Washington, D. C., together with thesis or publications, if required, prior to the hour of closing business on November 23, 1920.

The exact title of the examination, as given at the head of this announcement, should be stated in the application form.

Applicants entitled to preference should attach to their applications their original discharge, or a photostat or certified copy thereof, or their official record of service, which will be returned after inspection by the Commission.

PHARMACOLOGIST, $2,500–$3,000.

Receipt of Applications to Close Nov. 30, 1920.

The United States Civil Service Commission announces an open competitive examination for pharmacologist. A vacancy in the Bureau of Internal Revenue, Treasury Department, Washington, D. C., at $2,500 to $3,000 a year, and vacancies in positions requiring similar qualifications, at these or higher or lower salaries, will be filled from this examination, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion.

Applications.—Applicants should at once apply for Form 2118, stating the title of the examination desired, to the Civil Service Commission, Washington, D. C.; the Secretary of the United States Civil Service Board, Customhouse, Boston, Mass., New York, N. Y., New Orleans, La., Honolulu, Hawaii; Post Office, Philadelphia, Pa., Atlanta, Ga., Cincinnati, Ohio, Chicago, Ill., St. Paul, Minn., Seattle, Wash., San Francisco, Calif.; Old Customhouse, St. Louis, Mo.; Administration Building, Balboa Heights, Canal Zone, or to the Chairman of the Porto Rican Civil Service Commission, San Juan, P. R.

Applications should be properly executed, excluding the medical certificate, and must be filed with the Civil Service Commission, Washington, D. C., with the material required, prior to the hour of closing business on November 30, 1920.

Applicants entitled to preference should attach to their applications their original discharge, or a photostat or certified copy thereof, or their official record of service, which will be returned after inspection by the Commission.

RECENT DEATHS.

DR. BENJAMIN HERBERT YOUNG died at his home in Amesbury, October 22, 1920, aged 66 years. He was born in Rochester, N. H., attended Bates College and was graduated from the Medical School of Boston University in 1880. He had practised his profession in Amesbury since graduation.

DR. EDWIN LOUIS DROWNE died at the New England Baptist Hospital, from cardiac insufficiency, on Oct. 24, 1920, aged 43 years. He was a graduate of the Harvard Medical School, class of 1904, and a house-officer at the Boston City Hospital, following which he was for some time a resident surgeon at the Haymarket Relief Station. After that he was in general practice in Concord, but for some years had been treating cases of intestinal stasis and had his office in Boston.

He is survived by his mother, Mrs. Abbie S. Drowne of Mt. Vernon, N. Y., and by his widow who was formerly Miss Agnes Marks.

SOCIETY NOTICES.

HARVARD MEDICAL SOCIETY.—Next meeting in the Peter Bent Brigham Hospital amphitheatre (Van Dyke Street entrance), Tuesday evening, Nov. 16, 1920, at 8.15 o'clock.

PROGRAM.

Dr. Oliver Wendell Holmes and Harvard University.
Pres. Charles W. Eliot.

Recollections of Dr. Oliver Wendell Holmes.
Dr. F. C. Shattuck,
Dr. W. F. Whitney.

Drs. Whitney and S. W. Streeter will exhibit Holmesiana of interest to the medical profession.

Medical students and physicians are cordially invited to attend.

BOSTON TUBERCULOSIS ASSOCIATION. — The seventeenth annual meeting of the Boston Tuberculosis Association will be held at 3 Joy Street, Boston. Thursday, Nov. 18, 1920, at 3.30 o'clock. Addresses by Col. George E. Bushnell, who had charge of all the tuberculosis work in the army during the great war, and George S. C. Badger, M.D., President of the Boston Tuberculosis Association.

The public is invited.

There will be a short meeting of the members of the council immediately after the annual meeting.

ISABEL F. HYAMS, *Clerk.*